WHAT IS CLAIMED IS:

1. An electrical rotary machine using magnets comprising a rotor assembly facing a stator assembly for providing rotary driving force, said rotor assembly having a trailing edge portion for each of rotor magnetic pole configurations, said trailing edge portion adapted to have a strong magnetic field and create additional rotary driving force during synchronous rotation in association with both same and opposite magnetic poles of a stator facing the trailing edge portion of the rotor magnetic pole configuration.

2. An electrical rotary machine using a rotor, a stator and magnets, comprising a rotary assembly provided with radial or ringed magnets on insertion of magnets in the rotor, wherein each of magnetic pole configurations of the rotor is broad in width toward magnetic pole configurations of the stator along the rotation surface and has a trailing edge portion maintaining relative positions with the stator magnetic pole configuration, constantly with during synchronous rotation, normally enabling suction and repulsion by means of the stator magnetic pole configurations opposing around the rotor magnetic pole trailing portions, whereby rotary driving force is additionally increased.

3. An electrical rotary machine using a rotor, a stator and magnets, wherein each of rotor magnetic pole configurations comprising the magnets has varying angular pitch widths, wherein each of the rotor magnetic pole configurations has radial and ringed magnets on insertion of magnets in said rotor and a trailing edge portion including an air gap or non-

magnetic member part around all of these magnets so that magnetic flux of ringed magnets of said rotor does not return directly to said rotor magnets, magnetic flux in the air gap is rapidly increased, thereby eliminating cogging without providing skew by relative deflection of angular positions toward stator magnetic pole comprising electromagnetic coupling, and wherein the trailing edge portion of each of the rotor magnetic pole configurations constantly maintains relative positions with the stator magnetic pole configuration during synchronous rotation and, enabling suction and repulsion during rotation by means of the stator magnetic pole configurations opposing against the trailing edge portions of the rotor magnetic pole configurations, rotary driving force is additionally increased.

4. An electrical rotary machine using a rotor, a stator and magnets, wherein each of magnetic pole configurations of the rotor is provided with radial or ringed magnets on insertion of magnets in the rotor and wherein the rotor is subdivided into multiplicity such as cutting in round slices in the shaft direction of said rotor, wherein one part of subdivided rows in rotor is independently strengthened as a trailing edge portion of the rotor magnetic pole configuration and, at the time of synchronous operation, constantly maintains relative positions between the independently strengthened rotor magnetic pole trailing edge portions and the stator magnetic pole configuration, thereby normally enabling suction and repulsion by means of stator magnetic poles opposing front and rear of the trailing edge portion of the rotor magnetic pole configuration, the resultant effect is that of additionally increasing rotary driving force as possible.

5. An electrical rotary machine using a rotor, a stator and magnets, wherein the rotor is structured such that on insertion of magnets in the rotor, the interior sides relative to radial and ringed magnets have as same poles in the protruding part of rotor comprising part of magnet longer than length in shaft direction of the stator comprising iron core by electromagnetic coupling and the interior sides relative to radial and ringed magnets have opposite poles in the non-protruding part of rotor comprising part of magnet shorter than length in shaft direction of stator comprising iron core by electromagnetic coupling, and wherein magnetic flux in the air gap at trailing edge portion of rotor magnetic pole configuration at iron core end section of the rotor is rapidly increased, and wherein the trailing edge portion of the rotor magnetic pole configuration constantly maintains relative positions with the stator magnetic pole configurations during synchronous rotation, normally enabling suction and repulsion very strongly by means of the stator magnetic pole configuration opposing front and rear of the trailing edge portion of the rotor magnetic pole configuration, whereby rotary driving force is additionally increased as possible.

6. An electrical rotary machine using magnets, comprising a rotor provided with radial or ringed magnets on insertion of magnets in the rotor, wherein magnetic pole configuration of the rotor is broad in width toward magnetic pole of the stator, and constantly maintains relative positions during synchronous rotation, between the rotor magnetic pole trailing edge portion and the stator magnetic pole, normally enabling suction and repulsion by means of stator magnetic pole opposing the front and rear of rotor magnetic pole trailing edge portion, thus additionally increasing rotary driving force.

7. An electrical rotary machine comprising a rotor, a stator and magnets, the rotor provided with radial and ringed magnets on insertion of magnets in said rotor, wherein rotor magnetic pole configuration has varying angular pitch widths, eliminating cogging without skew by relative deflection of angular positions toward stator magnetic pole comprising electromagnetic coupling, at the same time preventing decrease in magnetic flux in the air gap, and wherein there is provided an air gap or non-magnetic member part around said magnets at trailing edge portions of the rotor magnetic pole configuration so that magnetic flux of ringed magnets of said rotor does not return directly to said rotor magnets, and wherein there is constantly maintained relative positions during synchronous rotation, between the rotor magnetic pole trailing edge portion and the stator magnetic pole, normally enabling suction and repulsion by means of magnetic poles at front and rear of stator, opposing front and rear of rotor magnetic pole trailing edge portion, thus additionally increasing rotary driving force.

8. An electrical rotary machine using a rotor, a stator and magnets, comprising radial and ringed magnets on insertion of the magnets in the rotor, wherein the rotor is subdivided into multiplicity in the shaft direction of said rotor, wherein one part of row comprising rotor structure is independently strengthened as rotor magnetic pole trailing edge portion, and wherein there is constantly maintained relative positions during synchronous rotation, between the rotor magnetic pole trailing edge portion and the stator magnetic pole, normally enabling suction and repulsion during rotation by means of magnetic poles at front and rear of stator, opposing front and rear of rotor magnetic pole trailing edge portion, thus additionally increasing rotary driving force.

9. The electrical rotary machine in Claim 2, 3 or 4, wherein the interior sides relative to radial and ringed magnets have same poles in the protruding part of rotor comprising part of magnet longer than length in shaft direction of stator comprising iron core by electromagnetic coupling, and the interior sides relative to radial and ringed magnets have opposite poles in the non-protruding part of rotor comprising part of magnet shorter than length in shaft direction of stator comprising iron core by electromagnetic coupling, thus increasing magnetic flux in air gap according to amount of protrusion.

10. The electrical rotary machine and electromagnetic apparatus in Claim 2, 3 or 4, adapted to be scaled up to be applicable to a mobile machine such as large-capacity apparatus and linear motor by replacing rotor magnet section with superconducting electromagnetic coil and the like.

11. The electrical rotary machine and electromagnetic apparatus in Claim 2 or 4, wherein improvement is made possible in performance by removing one section of magnets in radial and ringed magnet sections, and the magnetic force of magnets is adjusted to adjust the magnetic field of the asymmetrically configured magnetic pole section provided on the rotor.

12. The electrical rotary machinery and electromagnetic apparatus in any one of Claims 1 to 7 wherein the stator and rotor are reversed to enable rotation of stator side to become rotor, on the other hand, for stator from the rotor side formed into magnetic pole by magnets opposing stator, and external electricity is supplied to rotor by slip ring and additional driving force is generated by driving at synchronous speed.

13. The electromagnetic apparatus in any one of Claims 1 to 7 wherein the stator magnetic pole comprises magnets, and additional driving force is generated by enabling rotation and driving at synchronous speed by means of another prime mover.

14. The electrical rotary machinery in any one of Claims 1 to 9 wherein controller and prime mover are separated for actuation during the operation itself, eliminating operating loss from these to display maximum efficiency.

15. The electrical rotary machinery in any one of Claims 1 to 9, wherein controller and prime mover are separated for actuation from the operation during operation, stopping completely when abnormality such as excess load occurs during operation and is not corrected by repeatedly restarting several times for a short time.